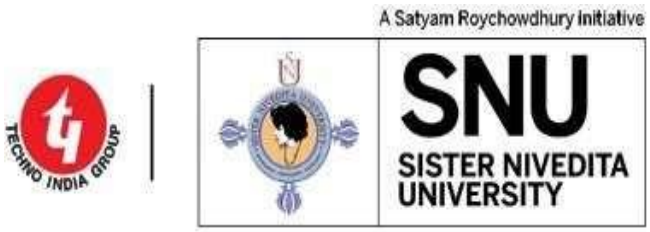

EXPLORING MENTAL HEALTH AND QUALITY OF LIFE AMONG BIOCHEMICALLY EUTHYROID INDIVIDUALS WITH A HYPOTHYROID HISTORY AND NORMAL INDIVIDUALS: A COMPARATIVE ANALYSIS IN KOLKATA

This dissertation is submitted for the partial fulfillment of the degree of

M.SC IN APPLIED PSYCHOLOGY (SPECIALIZATION IN CLINICAL PSYCHOLOGY)

SISTER NIVEDITA UNIVERSITY

Work under the supervision of

ANINDITA MUKHERJEE

Head of the Department

Department of Psychology

Sister Nivedita University

Submitted by

NEHA MAJUMDER

M.Sc Student

Department of Psychology

Sister Nivedita University

PLAGIARISM CERTIFICATE

I, Neha Majumder, hereby declare that the research work titled, ***"Exploring Mental Health and Quality of Life in Biochemically Euthyroid Individuals with a Hypothyroid History and Normal Individuals: A Comparative Analysis in Kolkata"***, conducted by me, has been completed with full honesty and integrity. I confirm that the work is original, and all sources of information have been appropriately acknowledged and cited. Furthermore, I affirm that the research work has undergone thorough plagiarism checks to ensure its authenticity. I take full responsibility for the content and findings presented in this research.

Neha Majumder

Date: 30/4/25

Name: NEHA MAJUMDER

Enrollment ID: 2322230002097

Program and Semester: M.Sc in Applied Psychology (Clinical Psychology Specialization)

Year: 2025

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CERTIFICATE

This is to certify that the dissertation entitled *"Exploring Mental Health and Quality of Life in Biochemically Euthyroid Individuals with a Hypothyroid History and Normal Individuals: A Comparative Analysis in Kolkata"*, submitted by Miss Neha Majumder, a 4th semester M.Sc student in Applied Psychology (Specialization in Clinical Psychology), Sister Nivedita University, is a bona fide work, which may be placed before the Board of Examiners for their evaluation. This is submitted in partial fulfilment for the Degree of M.Sc in Applied Psychology (Specialization in Clinical Psychology), Sister Nivedita University.

This is an original study conducted by the candidate and has not been submitted by her before in any form for any other degree of this University or any other University.

30-4-25

Anindita Mukherjee

Head of the Department

Department of Psychology

Sister Nivedita University

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Neha Majumder

Department of Psychology

Sister Nivedita University

ABSTRACT

Introduction: Hypothyroidism functions as a long-term endocrine disease which impacts both physical and psychological health aspects. Biochemical euthyroidism achieved through levothyroxine treatment does not eliminate the persistent symptoms affecting patients which include low mood, anxiety, stress and diminished quality of life. The relationship between thyroid function and mental health continues to remain intricate because researchers have not thoroughly studied it particularly in India. It is vital to understand psychological outcomes among hypothyroid individuals who achieve biochemical euthyroid status to support their complete well-being.

Objective: To assess the difference between biochemically euthyroid individuals with a history of hypothyroidism and normal individuals in respect to mental health status-depression, anxiety, stress and quality of life to understand the lasting impact of thyroid dysfunction on mental health and quality of life

Methodology: The research employed purposive sampling to study 98 adults (49 in each group) within an age range of 18 to 60 years. The study participants in this group were adults who received diagnoses of hypothyroidism while maintaining their euthyroid state through medication. The normal control sample included people who were free from any other chronic physical or mental health disorders. The Depression Anxiety Stress Scales (DASS-21) and WHO Quality of Life-BREF (WHOQOL-BREF) scale were administered to collect data from the participant.

Results: Research findings indicated hypothyroidism patients endured substantially increased stress rates alongside increased symptoms of anxiety and depression combined with diminished quality of life than the normal population. Biochemical euthyroidism attainment might not eliminate psychological distress experienced by patients.

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Chapter- I

INTRODUCTION

INTRODUCTION

The underactivity of thyroid gland produces hypothyroidism which leads to inadequate secretions of thyroid hormones T4 and T3. These hormones have a critical role in managing metabolic balance and controlling body temperature and supporting cardiovascular operation and maintaining proper psychological and nervous system health. The compromised hormone production leads to multiple metabolic and somatic and neuropsychiatric symptoms which damage physical condition and mental state (Chaker et al., 2017). Hypothyroidism shows a slow development of symptoms that health providers sometimes confuse with normal aging effects or chronic illness manifestations. The typical somatic health manifestations in hypothyroid patients involve persistent tiredness along with mysterious weight gain and reactions to cool temperatures and constipation and dry/rustic skin appearance and facial swelling and hair and brow hair thinning and voice hoarseness. More prolonged cases of hypothyroidism can result in bradycardia along with non-pitting edema (myxedema) and impaired respiratory or cardiovascular function (Chiovato et al., 2019). The psychological well-being of patients experiencing hypothyroidism experiences serious deterioration because of this medical condition. Individuals with hypothyroidism experience decreased concentration along with cognitive slowdown, sadness and irritability during an ongoing feeling of despair and diminished drive. The condition also leads to unstable emotional states. Some clinical pictures are characterized by psychological symptoms which can result in primary psychiatric disorder diagnoses missing the correct diagnosis especially depression (Dayan & Panicker, 2013). Women in their reproductive years with hypothyroidism develop menstrual problems and anovulatory infertility and reduced fertility which together increase their psychological troubles (Taylor et al., 2018). Hypothyroidism develops as either primary or secondary condition based on its etiological source. The primary form of hypothyroidism develops when intrinsic thyroid gland pathology generates this condition and represents the most prevalent manifestation. The main factor behind primary hypothyroidism in iodine-sufficient regions stems from Hashimoto's thyroiditis as an autoimmune disease that triggers cellular damage through lymphocytic infiltration of thyroid tissue. The presence of elevated anti-thyroid peroxidase (TPO) and antithyroglobulin antibodies in

blood confirms the diagnosis of the condition. Thyroidectomy combined with radioactive iodine therapy and neck radiation treatment make up additional causes of hypothyroidism. Medications including lithium, amiodarone, and tyrosine kinase inhibitors negatively affect thyroid hormone synthesis and secretion operations (Biondi & Cooper, 2008). The dysfunction of pituitary gland or hypothalamus leads to impaired thyroidstimulating hormone (TSH) secretion and secondary hypothyroidism formation through an indirect mechanism (Chaker et al., 2017). This condition occurs less frequently compared to primary hypothyroidism. A lack of iodine in the diet continues to be an important trigger for hypothyroidism particularly among people who live in rural and underdeveloped areas with persistent iodine deficiencies. The pharmaceutical treatment of hypothyroidism requires patients to take oral levothyroxine supplements throughout their lives to balance their T4 hormonal levels and normalize TSH measurements. The majority of people show good laboratory results after undergoing therapy but their clinical improvement does not necessarily match their improved test values. Thyroid hormone level normalization does not eliminate the persistent symptoms including cognitive dullness, low energy, depressive symptoms, and quality-of-life dissatisfaction among patients who have untreated hypothyroidism accompanied by autoimmune thyroiditis (Wartofsky, 2013). Scientific investigations have substantially increased since patients demonstrated biochemical euthyroid yet continued subjective symptoms. Various factors like ongoing autoimmunity and poor T4-to-T3 peripheral conversion and inadequate hormone cell activation and psychological factors may contribute to this observed mismatch. Hypothyroid patients need a comprehensive biopsychosocial care strategy because stress along with inflammatory responses and neuroendocrine alterations intensify their mental health problems (Dayan & Panicker, 2013). Major Depressive Disorder (MDD) receives the medical diagnosis of Depression which remains one of the most widespread and most damaging psychiatric problems across the global scale. It develops into an ongoing condition with diminished mood states combined with emotional detachment and minimal involvement in any usual activities. Depression creates substantial functional limitations in social life and occupational performance and personal activities for individuals thus causing feelings of deep hopelessness and heavy sadness along with self-doubts (American Psychiatric Association [APA], 2013). Depression belongs to the category of mood disorders yet its reach extends far beyond mood associations since it disrupts cognitive processes and causes physical problems and damages interpersonal

relationships and diminishes productivity. Depression presents a diverse set of symptoms that impact mental as well as physical aspects of human health. Medical professionals diagnose depression when at least five symptoms including persistent sadness and activity disinterest last for two weeks and include either weight or sleep disturbances and motor-rest and energy-level problems as well as self-doubts and difficulty maintaining focus and thoughts of self-harm. Scientific research demonstrates that depression runs in families because affected relatives show an elevated risk for the disorder thus indicating a genetic factor (Kendler et al., 2006). The presence of impaired neurotransmitters especially serotonin norepinephrine and dopamine show strong correlations to depressive symptoms. The chemical imbalance of neurotransmitters in depression creates both psychological and physical signs which affect mood functions as well as energy metabolism and drive mechanism (Belmaker & Agam, 2008). Depression develops and persists mainly because of unhealthy thinking patterns along with early traumatic experiences and reduced self-worth and inadequate coping mechanisms. In the Cognitive Theory of Depression, depressed individuals display a behaviour of negatively distorting their perception of life circumstances. Those who become depressed develop internalize dysfunctional beliefs together with automatic thoughts which focus on personal failures and perceptions of worthlessness and hopelessness toward the future. Beck defined this system of pessimistic self-perceptions as the “negative cognitive triad” which includes negative beliefs about personal identity as well as the world and the future (Beck,1967). In Seligman’s Learned Helplessness Theory the amount of perceived control stands as a central factor contributing to depression. Based on animal research Seligman (1975) developed this theory which shows that people become helpless in their situations when faced with prolonged adverse events thus creating helpless emotions (Seligman, 1975). The new model within the theory examines attributional styles to demonstrate that people exposing negative events to internal stables and global causes experience heightened depressive thinking (Abramson, Seligman, & Teasdale, 1978). Separate from genetic and biochemical risk factors environmental elements and social events perform essential roles in causing depressive conditions. Three main categories of long-term stressors (Brown & Harris, 1978) include poverty and job loss together with interpersonal conflicts and mourning a lost loved one and insufficient social connections. The early experience of neglect or abuse or losing a parent functions as a stresssensitive factor that increases vulnerability to later develop depression. Feelings of helplessness and social isolation alongside

cultural and societal discrimination as well as violent experiences worsen despair among people. Depression research has benefitted from the biopsychosocial model which combines biological weaknesses which include genes and chemicals with psychological patterns and social influences which involve stressful events from the environment. The model establishes depression emerges from unified complex systems whose components influence each other across time. Gene-induced mood disorder tendencies coupled with child development of dysfunctional coping skills eventually lead to long-term work pressures which create a combination that produces adult depression (Engel,1977). The emotional and physical disorder which anxiety represents itself through continuous worrying and increased nervousness brings fear about possible future occurrences. Anxiety differs from fear because it develops even when no threat appears directly in front of the person while anxiety sustains constant distress and increases sensitivity towards future possibilities. People with anxiety deal with ambiguous situations since anxiety creates distress regardless of whether the threat either exists or not (American Psychiatric Association, 2013). Different types of anxiety symptoms present in emotional, cognitive, physical and behavioural forms. People troubled by anxiety exhibit chronic fear together with persisting irritability and experience a constant state of tension. Anxiety results in poor concentration as well as circular thoughts and decision-making challenges along with the habit of focusing on anticipated negative occurrences. Cognitive distortions which develop from anxiety result in destructive thinking patterns and increase emotional sensitivity (Beck & Emery, 1985). Anxiety results in physiological manifestations which include quickened heartbeat and muscle strain and rapid breathing and heavy sweating and stomach upset and lightheadedness and gastrointestinal dysfunctions. The sleep cycle gets disturbed while exhaustion persists and the body remains easily agitated. People exhibit anxiety-provoking situation avoidance and perform repetitive actions while creating safety behaviours to reduce perceived threats (Etkin & Wager, 2007). Multiple factors at various levels create the emergence of anxiety as a psychological issue. Medical research shows that people with anxiety disorders in their family tree develop similar conditions more frequently due to genetic inherited factors (Hettema, Neale, & Kendler, 2001). The genetic predisposition alone does not determine the start of anxiety behaviours. Early-life developmental experiences along with them impact the way individuals become vulnerable to anxiety. Multiple types of traumatic experiences along with persistent stress factors resulting from bereavement or from severe controlling or

critical parenting styles lead to developing anxious behavioural patterns (Wood et al., 2003). In psychodynamic theory Freud explains how anxiety develops from conflicts that exist internally between mental processes. The ego develops anxieties because it confronts demanding pressures from both instinctual desires of the id and internal moral standards of the superego and external reality drives according to Freud (1926). The specific form of neurotic anxiety emerges when an individual fears the emergence of submerged psychological impulses from the unconscious. The psychological conflicts create internal tension which the ego resolves through mechanisms including repression and denial and displacement. A youngster who fails to resolve a past conflict tends to develop generalized anxiety as an adult. Psychoanalytic theory faces empirical evidence challenges but modern psychodynamic approaches maintain focus on early attachment development together with hidden mental processes and emotional troubles which create anxiety (Freud, 1926). The amygdala brain structure shows elevated activity levels in persons with anxiety according to neuroimaging research (Etkin & Wager, 2007). Greater brain activation causes people to overreact to potential threats which they might wrongly interpret in daily life situations. Areas of the prefrontal cortex along with regulatory neural regions display lower activity levels when compared to other brain regions. Suboptimal functions within the hippocampus prevent people from discerning between genuine threats and false perceptions of danger. The lower amounts of GABA molecules contribute to anxiety disorders because GABA inhibits excessive neural signaling.

Restlessness worsens as well as irritability because of serotonin and norepinephrine system disorders (Nutt & Malizia, 2001). Pharmacological treatment research for anxiety has strongly benefited from biological understanding of these behavioural patterns. The psychological and physiological phenomenon known as stress emerges when people experience their resources being overwhelmed by their external requirements (Lazarus & Folkman, 1984). A scenario that leads to stress affects different people in different ways because stress operates on both common and personal levels during physiological and psychological experiences. The research conducted by Holmes and Rahe (1967) demonstrates that stress develops when individuals face environmental sources and personal expectations as well as internal conflicts. Stress symptoms show themselves through various presentations which span from mental and emotional through physical expressions to behavioural symptoms. Individuals under

stress feel emotionally anxious and sad or irritable while suffering from cognitive challenges which affect concentration and produce negative thoughts (APA, 2021). Behavioural indicators include alterations in how much people eat combined with sleep problems alongside reduced social interaction. The effects of persistent stress damage individuals' physical state and mental condition (McEwen, 2006). The emergence of stress happens because of external events including major life shifts and work demands yet self-negating thoughts and unrealistic demands also act as internal factors (Holmes & Rahe, 1967). The body activates its fight-or-flight response because of stress regardless of whether the stress happens in short or long periods which may negatively impact personal wellness. According to the theory it establishes two appraisal modes through primary and secondary appraisal. The initial appraisal step involves people examining whether environmental circumstances threaten them or serve as dangers or harmful situations. People move on to secondary appraisal when they detect a dangerous or threatening situation but check their available resources first (Lazarus & Folkman, 1984). The model demonstrates that stress develops when someone believes their coping ability is insufficient to deal with a situation. A worker facing a pressing work deadline will see the situation as distressing when they believe they do not have sufficient time and resources to fulfill the assignment. According to Lazarus and Folkman (1984) individuals employ two primary coping methods including problem-focused strategies for dealing directly with the stressor along with emotion-focused methods for controlling their stress-related emotions. Under this model stress represents a changing phenomenon which develops through the combinations of stressor evaluations and personal beliefs regarding their coping capabilities. A person losing their job creates both monetary shortages and social resource deficits which results in stress development. Stress reaches its peak in individuals who possess fewer resources since they lack sufficient means to manage daily life pressures, building up of resources through time enables individuals to develop stronger ability to withstand stress challenges. Emotional assistance combined with tangible help practices from social networks effectively decreases stress impacts through the protection of existing resources (Hobfoll,1989). According to Diathesis-Stress Model, the diathesis (or vulnerability) can be genetic, such as a family history of depression, biological, such as hormonal imbalances, or psychological, such as tendencies toward negative thinking. Stress becomes a precipitating factor that may lead to the development of mental health conditions when these vulnerabilities are activated. For instance, an individual with a

genetic predisposition to depression may be more likely to develop the condition after experiencing a significant life stressor, such as the loss of a loved one (Monroe & Simons, 1991). This model underscores the importance of both environmental stressors and inherent vulnerabilities in the development of mental health disorders, suggesting that individuals with greater vulnerabilities are more likely to experience adverse psychological outcomes when faced with stress. Quality of Life (QoL) is a multifaceted concept that encompasses an individual's overall well-being, including physical health, emotional state, social connections, and psychological functioning. It goes beyond the mere absence of illness or disability and reflects a more comprehensive evaluation of how individuals perceive their lives and adapt to their surroundings. According to the World Health Organization (WHO, 1997), QoL is a subjective experience, shaped by personal perceptions, cultural factors, and social contexts. As such, QoL is commonly employed in health-related research to evaluate outcomes that extend beyond clinical symptoms, focusing on a broader perspective of well-being. The World Health Organization (WHO 1997) developed the WHOQOL model which serves as an extensive framework to analyse QoL. According to the WHOQOL model six core domains form the basis for assessing whole-life satisfaction in individuals. Physical Health represents the first domain within the WHOQOL model which assesses physical abilities and energy and pain intensity and task completion capabilities. Life satisfaction gets diminished when individuals experience chronic illnesses or disabilities because of their impact on physical health (World Health Organization, 1997). The psychological aspect of well-being consists of emotional health together with self-esteem and mental wellbeing which provides stress management abilities. Research shows that psychological health serves as a vital factor for QoL since mental instability causes life satisfaction to decrease (Skevington, 2002). The quality of social relationships that involves connections between family members along with friends and the wider community establishes an essential component of Quality of Life. Social networks that provide strong support help people handle stressful situations better while boosting their sense of community and life contentment (Skevington, 2002). The environmental domain includes both physical and social aspects which construct the framework of individuals' personal lives. Living conditions together with healthcare access along with safety and available growth opportunities constitute fundamental aspects that influence QoL according to World Health Organization (1997). The domain of independence allows people to maintain their capacity to perform daily obligations autonomously

which includes both physical movement and personal autonomy. Loss of independence negatively affects QoL especially when someone ages or becomes ill according to Skevington (2002). The QoL for numerous people receives essential contributions from their religious or personal beliefs alongside their spiritual sense. The connection individuals feel toward religious doctrines together with their spiritual beliefs creates mental wellness and adaptive powers according to Skevington (2002). Within the WHOQOL model each domain connects with other domains to create overall quality of life for individuals. Disposable income enables someone with chronic illness to preserve good psychological well-being through supportive relationships and good environment conditions. The World Health Organization (1997) pointed out that QoL functions as a dynamic and subjective experience affected by multiple internal and external elements. SWB under this theory consists of three parts that form subjective well-being. Life Satisfaction describes the cognitive dimension people use to judge their general life contentment. Human fulfilment exists when someone experiences their existence corresponds to personal aspirations and expected achievements (Diener, 1984). 2.Positive Affect: This emotional component refers to the frequency and intensity of positive emotions, such as happiness and contentment. Positive emotions create an immediate boost which leads to better well-being and improved QoL according to Diener (1984). Negative Affect stands in opposition to positive affect since it describes both the frequency and intensity of emotions that are negative such as sadness and anxiety. According to Diener (1984) elevated negative affect creates poor QoL since it creates distress which also lowers life satisfaction. According to Diener's theory an individual's QoL emerges from both psychological assessment factors and emotional well-being elements. According to Diener (1984) people experience higher QoL levels when they have positive emotions and greater life satisfaction yet frequent negative emotions lead to reduced QoL. The theory demonstrates that positive mental outlook together with emotional well-being serve as essential factors for improving quality of life. Patients with underactive thyroid functions develop hypothyroidism which leads to hormonal deficits in T3 and T4 which negatively affects metabolic health together with heart system and brain health. The syndrome appears as a combination of physical symptoms along with neurological ones which cause exhaustion and cognitive failure and mental distress yet physicians frequently dismiss these signs. Multiple hypothyroidism patients persist with symptoms following levothyroxine treatment because of their autoimmune condition along with hormone conversion problems and

psychological stress. A biopsychosocial model best explains depression along with anxiety symptoms in hypothyroidism because it includes biological changes in addition to psychological factors and social determinants of poor mental health. The assessment of persisting psychological consequences and life quality aspects among hypothyroidism patients who reach biochemical euthyroid status remains essential. The research investigates the mental health outcomes as well as quality of life findings between hypothyroidism survivors with treatment history versus subjects who have never required thyroid intervention. The research needs a solid foundation built from reviewing established literature which examines thyroid disorders in relation to psychological health and satisfaction regarding quality of life.

Chapter II

REVIEW OF LITERATURE

REVIEW OF LITERATURE

In the context the APA Dictionary of Psychology, a literature review is a concise overview of the existing research on a particular topic. It's not just a summary of individual articles, but rather a synthesis, interpretation, and evaluation of those articles, with a focus on their relationships and relevance to a specific research question or area of inquiry.

Hypothyroidism patients regularly develop depression and anxiety which elevates their patient-related distress levels. Treatment of hypothyroidism requires proper management because this endocrine disease affects many people which contributes to worsen mental health symptoms. Among 1,600 patients with hypothyroidism from Kerman, Iran research showed that depression occurred in 59% of participants while anxiety affected 63%. Research showed that multiple metabolic factors directly linked with these disorders. Both anxiety and depression were found to have direct connections with elevated TSH together with LDL, TG, FBS alongside TC and hypertension levels. Research points to an association between TPoAb and TGAb levels and anxiety development with no link to depression. Analysis indicates that therapeutic management of particular metabolic factors should minimize depression alongside anxiety symptoms in hypothyroidism patients which enhances both their medical responses and life quality (Dehesh et al.,2025).

The production deficit of thyroid hormones in patients with Hypothyroidism results in noticeable alterations of cardiovascular health and psychological stress. Stress modifies the hypothalamic-pituitary-thyroid (HPT) axis to produce these connections between conditions. A recent study measured subjective stress alongside HRV in order to examine 77 hypothyroid patients with TSH > 5.0 mIU/L compared to 77 healthy controls with TSH 0.5–5.0 mIU/L. Research outcomes showed that hypothyroid patients exhibited significant alterations in their autonomic control system resulting in prolonged average RR intervals and elevated LF/HF ratio and decreased RMSSD indicators along with pRR50 and HF values. A substantial number of the surveyed patients described their stress as severe according to their own assessment. The evaluation showed that higher TSH levels along with autonomic imbalance and elevated

stress scores form a direct relationship which demonstrates that poor thyroid function strongly interacts with biological and mental stress responses (Singh et al., 2024).

The manifestation of neuropsychiatric symptoms occurs regularly in thyroid disorders which present as depression dementia and mania and Hashimoto's encephalopathy. Scientific investigations about these relationships have accumulated across the last fifty to sixty years thereafter. This paper explains how thyroid-related neuropsychiatric symptoms originate particularly through the example of autoimmune Hashimoto encephalopathy. The research examines the direct correlation between thyroid-stimulating hormones and cognitive deterioration patterns in patients. Clinical studies demonstrate that Hypothyroidism triggers depression and mania but hyperthyroidism produces dementia and mania as symptoms. Graves' disease exhibits links with multiple mental health conditions such as depression and anxiety together with other Graves' disease-related mental health effects. This study employed PubMed database research to determine what neuropsychiatric symptoms occur in adults who suffer from thyroid diseases. The research shows thyroid disorders cause cognitive problems yet scientists have not proven hyperthyroidism as an accelerator for dementia development. Older adults face higher dementia risks when their free thyroxine T4 levels are high and their thyroid-stimulating hormone TSH levels are low and when they show subclinical hyperthyroidism. The analysis explores pathway mechanisms while reviewing studies documenting mania as a hypothyroidism symptom with focus on probable causes of this condition and its disease development (Lekurwale et al., 2023).

Optimal thyroid hormone replacement therapy does not ensure improved healthrelated quality of life for patients with primary hypothyroidism. The HR-QoL scores of 175 hypothyroid patients who received treatment showed a visible decrease in mean scores particularly affecting their physical health-related role functionality. The research established that Hypothyroidism symptom score correlated negatively with HR-QoL results as well as demonstrating a connection between HR-QoL ratings and the amount of thyroxine medication. The research did not identify a significant connection between HR-QoL and thyroid function measurements. Symptom management and precise hormone therapy should be implemented to enhance life quality among these patients (Martin et al.,2023).

Within the 1970s physicians began using synthetic levothyroxine as the main medical approach to treat hypothyroidism instead of thyroid extract. The treatment of

hypothyroidism has experienced no significant developments since the 1970s. Subclinical hypothyroidism definitions remain unsettled since largescale testing leads physicians to start therapy at low thyroid-stimulating hormone thresholds which were previously thought normal. Levothyroxine treatment enhances quality of life however it does not fully reach normal levels mainly affecting patients with mild hypothyroidism. Medical research shows that adding liothyronine to levothyroxine or switching to desiccated thyroid extract does not lead to better patient satisfaction. Further studies must investigate personal TSH baseline values in addition to evaluating multiple thyroid hormone doses alongside their response to autoimmune states along with other existing medical conditions. The long-term health consequences of hypothyroidism need evaluation as well as establishing the risks accompanying incorrect treatment approaches (Hegedu s et al.,2022).

AITD as a group of autoimmune thyroid diseases consists of two main conditions which are Graves' disease (GD) alongside Hashimoto's thyroiditis (HT). These diseases represent the top thyroid disorders among patients. The research analyzed the prevalence numbers of HT and GD alongside their relationship with stress factors along with stress recognition patterns and additional relational elements. Physicians evaluated 107 patients with autoimmune thyroid disease at an endocrinology outpatient clinic in San Nicola s de Los Arroyos Argentina through physical assessments and systematic evaluation of medical records combined with surveys. The study results showed HT as the dominant thyroid illness while women represented the largest affected group. The patients were typically diagnosed after turning 45 and before their 61th birthday at 45.7 ± 15.7 years old. Among the study patients 14% indicated they did not encounter any traumatic event but stress became a major issue for more than half of the participants. A strong majority of 59 percent of patients showed physical inactivity while at least 60 percent suffered from deficient vitamin D levels according to our study findings. The research team proposes that stress together with obesity and vitamin D shortage can help create AITD while recommending future long-term investigations to discover true cause and effect patterns (Pezzotto, 2022).

Worldwide public health authorities consider thyroid disorders that encompass hypothyroidism and hyperthyroidism and Graves' disease and Hashimoto thyroiditis as major health problems. The research evaluated the share and strength of psychosomatic symptoms that include distress along with depression and anxiety and somatization

between individuals with thyroid disorders and those in good health. The research took place between February-July 2019 throughout Serbia by studying 335 participants between thyroid disorder patients and healthy clinical participants. Participants responded to psychosomatic symptom reports using the Four-Dimensional Symptom Questionnaire a selfreporting instrument. Statistical tests showed thyroid disorder patients developed more psychosomatic symptoms compared to controls, as 59.8% of patients reported notable distress and their depression scores reached almost twice those of the control group while anxiety affected 46.2% of patients and somatization impacted 69.7% of patients. The analysis showed that hypothyroid patients displayed similar depression and anxiety levels compared to individuals in the control group and people who had Graves disease or Hashimoto thyroiditis displayed parallel results to healthy subjects. The research established that patients with thyroid issues show greater psychosomatic symptom intensities compared to people without thyroid diseases (Stanic et al., 2022).

Levothyroxine (LT4) dosage modifications aimed at moving TSH levels into normal ranges have no substantial impact on hypothyroidism-related metabolism or energy expenditure or body composition measurements. Research investigators examined 138 participants with stable TSH profiles in this double-blind randomized trial by allocating subjects into three TSH target groups through LT4 dosage adjustments during a six-month period. The research demonstrated that different TSH levels did not affect metabolism but did show a pattern between lower thyroid function and decreased resting energy expenditure. Participants chose what they assumed to be higher LT4 doses though no objective metabolic changes were detected. The study results indicate that weight and metabolic benefits will not increase when healthcare providers modify thyroid-stimulating hormone reference levels in patients (Samuels et al.,2018).

The combination of autoimmune diseases (AID) elevates anxiety and depression symptoms while causing thyroid hormone imbalance in patients. The results demonstrated that AID patients exhibited diminished FT3 and FT4 levels together with increased TSH concentration. The hormone levels of FT3 and FT4 showed opposite trends to severe depression and anxiety while TSH hormone levels proceeded upwards. The blood concentration of FT3 and FT4 decreased substantially in AID patients who experienced either depression or anxiety although TSH hormone measurements remained stable between patients with depression. Studies revealed that patients with

elevated FT4 levels had an independent connection to decreased probabilities of experiencing anxiety or depression. The research indicates that FT4 thyroid hormone plays an essential part in governing anxiety and depressive symptoms among patients suffering from autoimmune diseases (Siegmann et al., 2019).

The results showed that health-related quality of life stands markedly lower in hypothyroid patients from India according to SF-36 questionnaire assessment. People with hypothyroidism scored substantially lower than healthy participants in all physical health domains except emotional roles and social functioning according to Scored based on the Standardized 36-Item Short Form Survey. The groups presented similar levels of emotional roles and social functioning in the study despite other significant findings. The study results show that hypothyroidism mostly impacts physical aspects of health so healthcare professionals must adopt comprehensive approaches in treating patients (Shivaprasad et al.,2018).

Research demonstrates that thyroid dysfunction leads to changes in mood together with cognitive function since the discovery of thyroid diseases. The study of thyroid disorder effects on various medical conditions has advanced through time in order to develop better comprehension and treatment strategies. Research interest about thyroid hormone level alterations from normal limits on mood and cognitive function has risen particularly among older adult populations during recent years. The research evaluates the effects of thyroid hormone levels on mood and cognitive performance among subjects with various thyroid conditions including overt and subclinical hypothyroidism and subclinical and overt hyperthyroidism. Patients with overt hypothyroidism benefit from thyroid dysfunction treatment but experienced cognitive symptoms typically stay within the subtle range. Studies have demonstrated that patients with subclinical hyperthyroidism along with normal range free thyroxine (FT4) levels typically exhibit negative cognitive performance results. Additional research using randomized controlled trials will help create therapy plans for older patients dealing with subclinical thyroid disorders (Jua rez-Cedillo et al., 2017).

The reduction of thyroid hormones in hypothyroidism affects people throughout all age groups leading to deterioration in both life quality and mental well-being specifically regarding management of the condition throughout the long term. The goal of this research was to examine how hypothyroid patients (95 people) performed relative to 95 healthy participants regarding their quality of life and mental health status. The General

Health Questionnaire was used to collect data related to physical symptoms alongside anxiety manifestations and social dysfunction and depression while Quality of Life Questionnaires were used in this process. The quality of life evaluation between hypothyroid patients and their healthy counterparts remained similar while hypothyroid patients demonstrated lower mental health scores [59.70] among all aspects compared to healthy participants [48.68] ($P < 0.001$). The research indicates that hypothyroid patients might benefit from enhanced mental healthcare interventions since such programs seem well-suited for Iran because of its cultural and religious characteristics (Rakhshan et al., 2017).

The monitoring of hypothyroidism-related health-related quality of life (HRQL) through validated tools has not been systematically conducted despite being often detected through HRQL concerns. A prospective cohort evaluation of HRQL specific to thyroid disease (ThyPRO) along with general SF-36 measures took place for 78 hypothyroidism patients with autoimmune thyroiditis receiving levothyroxine therapy at Danish university hospital clinics. Study participants used HRQL measurement tools initially and again at the six-week mark then six months following treatment starting point and research data was cross-referenced against reference sample groups. Almost all HRQL scores displayed significantly lower levels before treatment yet fatigue and vitality were the worst affected domains. ThyPRO domains experienced significant improvement after six weeks which continued beyond six months until many SF-36 domains reached better status yet some residual impairments persisted. The research shows how hypothyroidism creates major impacts on HRQL before treatment yet indicates that levothyroxine therapy produces beneficial improvements although complete HRQL recovery might fail to occur after six months of treatment (Winther et al.,2016).

Iranian women participating in the study demonstrated higher depressive symptoms when they had hypothyroidism than those without thyroid problems according to the DASS-21 depression assessments. Thirty hypothyroid patients were matched with thirty euthyroid individuals to conduct the comparison and both groups were homogenous for age, sex and education. The hypothyroid women who displayed higher depression scores in the study did not demonstrate any correlation to their age level education background marital status or employment situation. The research shows

hypothyroid women face a higher risk of depressive symptoms that exists without relation to their personal demographics or socioeconomic factors (Zavareh et al., 2016).

Hypothyroidism that goes undetected in medical tests (sHT) occurs with regularity throughout the general population most notably affecting aging adults along with women. Individuals suffering from sHT do not show noticeable symptoms even though their condition creates problems on par with those found in overt hypothyroidism that diminish quality of life (QOL). Learned knowledge of the condition may create negative effects on how patients evaluate their health status. Cognitive functioning determines QOL variables so evaluation of these elements must be performed as a single assessment. The researchers engaged in an extensive study of English-language scientific literature from 1980 onwards by searching through databases including the National Library of Medicine. Hypothyroidism, sHT and ageing along with L-thyroxine treatment and cognition and brain health and quality of life formed the main points of their review. In addition to academic literature the authors consulted textbooks and their personal collection of publications along with studies related to their research field. The review analyzed what chemical processes might lead to cognitive decline when someone has thyroid dysfunction. Recent studies show inconsistent results including the impact that sHT has on both cognitive ability and health-related QOL. Most individuals with autoimmune thyroid conditions experience reduced quality of life although hormone levels do not always correspond with these reports. The research presented important patents which corresponded to its findings (Ritchie & Yeap, 2015). People who have thyroid disorders face high risks of developing anxiety and depression as psychiatric conditions that decrease both their treatment results and life quality. The study involving 129 adult patients demonstrated high occurrences of anxiety reaching 50.4% as well as depression affecting 42.6% of the participants. The study research revealed hypothyroidism among 69.8% of participants and 79.1% were women. The data showed high anxiety rates affecting 54.9% of women specifically along with people earning less income (73.9%) and patients diagnosed with hyperthyroidism (64.1%). The most prevalent experiences of depression occurred among women (47.1%) as well as individuals who were part of the Janajati ethnic groups (54.8%), earned low incomes (69.6%) and also had hyperthyroidism (56.4%). Research did not discover any important relationships connecting work status, marital status, family type, religion or duration of illness to the participants. Research data indicates that managing

thyroid conditions requires complete healthcare solutions that must include both mental health monitoring and routine testing specifically for women and anyone with hyperthyroidism or income-related healthcare barriers (Tognini et al., 2014).

Multiple studies have investigated the relationship between hypothyroidism and depression since the beginning of the millennium yet scientists find it impossible to determine the exact link because various research results disagree. The exploration of hypothyroidism-depression relationships improved substantially when research analysts conducted large cohort and genetically driven studies in recent years. The results of PubMed literature reviews support no connection between depression and thyroid functions in participants who do not have thyroid disease. People on thyroxine medications document worse psychological state than individuals who do not have thyroid problems despite having normal thyroid metabolic status. The emerging evidence reveals that genes potentially determine what influence thyroxine treatment has on well-being for patients and their reaction to combination therapy. People taking thyroxine experience their most significant level of morbidity because their symptoms are often misdiagnosed or wrongly interpreted. Several investigations about thyroid-depression link relationships exist but scientists still cannot understand the connection well enough so new genetic-factor-driven research must solve thyroid function's mental health role (Dayan & Panicker, 2013).

The functioning of the thyroid plays a crucial role in mood control functions and scientists have discovered its connection to depression. A research investigation sought to investigate the differences between thyroid stimulating hormone (TSH) and thyroxine (T4) and triiodothyronine (T3) levels present in depressed patients vs healthy subjects. The research included sixty drug-naive depression patients who received clinical diagnoses together with sixty healthy participants who had matching ages and sex. Depression severity was evaluated through the Hamilton Depression Rating Scale which assigned grades ranging from mild to severe to moderate based on results. The biochemical parameters TSH, T3, and T4 were quantified using standard commercial kits while statistical analyses relied on ANOVA test alongside χ^2 test. Research data indicated significant changes between the depression patients and control participants through lower T3 measures and increased T4 counts. The measurement of TSH levels demonstrated no statistical difference based on the extent of depression observed in patients. Depression affected 12 patients who showed signs of thyroid dysfunction also

known as "Lower Thyroid Syndrome." The study data pointed toward gender discrimination since it revealed that depressed patients primarily belonged to the female gender group. The research shows that thyroid complications manifest frequently among patients with depression so thyroid assessment stands as a required diagnostic tool in comprehensive depression care (Kamble et al., 2013).

The relationship between thyroid function and depression has received established scientific evidence. People who have hypothyroidism often develop depressive symptoms yet depression itself might cause various small thyroid function problems during treatment. Kuboyi and Otu (TN) identified four sets of thyroid alterations among depressed patients including increased T4 levels, low T3 and elevated rT3, delayed TRH treatment response and positive thyroid antibodies plus elevated TRH in cerebrospinal fluid. Patients who receive thyroid hormone supplements benefit from speedier antidepressant effects which are bolstered in their therapeutic outcomes. Scientific research has established such connections but<script> and</script> the underlying biological reasoning behind thyroid-depression relationships remains unclear. The discovery of new biochemistry information and genetic findings together with neuroimaging technology has generated expanded knowledge about thyroid-depression connections (Hage & Azar, 2012).

Health-related quality of life (HRQL) measures performed by patients have become more prominent in modern clinical research. The acquisition of meaningful results from HRQL surveys requires a proper evaluation of survey parameters. Demonstrating content validity stands as an essential step because it verifies that the questionnaire details all important issues. Studies have examined thyroid disease effects through evaluations of standard thyroid symptoms and general aspects of health-related quality of life to determine the primary concerns of hypothyroidism patients. Review of available thyroid patient assessments included 75 relevant studies from comprehensive database research within Medline and Cinahl and Psycinfo. Multiple research studies have shown that patients without thyroid treatment manifest multiple symptoms which lead to major impairments that affect most areas of HRQL. Long-term problems related to HRQL affect patients frequently according to research findings. Six HRQL assessments dedicated to thyroid patients were discovered during the research although each study demonstrated insufficient validation evidence. Research shows that hypothyroid patients suffer reduced quality of life in multiple healthrelated quality of

life dimensions during their untreated state, while this health deterioration persists in numerous individuals chronically. The comparative influence of multiple factors affecting thyroid patients remains unidentified through scientific research (Watt et al., 2012).

Research has studied psychological effects in thyroid dysfunction patients yet almost all previous studies examined untreated individuals with active hypothyroidism. Biochemical euthyroidism achieved through medical treatment has not been adequately addressed by existing studies regarding its impact on mental health status. Comparable research is scarce which demonstrates the psychological and life quality variations between patients who have normal thyroid function continuously and those who achieve medical treatment success after hypothyroidism diagnosis. The current research uses a comparative crosssectional study approach to examine stress, anxiety, depression levels and quality of life between people who have attained euthyroidism with the help of medication and normal individuals. Next the research design details how the methodology was implemented with sample selection and assessment tools and statistical techniques specified for assessing the study objectives.

Chapter III

METHODOLOGY

METHODOLOGY

According to American Psychological Association methodology is the system of methods, principles, and rules of procedure used within a particular discipline. In research and experimental design the term refers to the techniques used to collect information, and in statistics it refers to the procedures used to analyze such data. Methodology refers specific procedures or techniques to identify, select. process or analyze data or information about a topic. In other words, it is a structured framework of conducting research in order to address various issues and solve problems.

The present study is concerned with mental health status: anxiety, depression, stress and quality of life of individuals who are biochemically euthyroid with a history of hypothyroidism and normal individuals. The purpose of the study is to compare and explore these psychological aspects in individuals who are biochemically euthyroid with history of hypothyroidism and normal individuals to understand the lasting impact of thyroid dysfunction on mental health and overall well-being.

The term methodology refers to specific procedures or techniques used in the process of identifying, selecting, processing, and analyzing data or information about a topic. In other words, it can also be said as a structured framework for conducting research in order to cover various issues and solve problems.

In the present study, an attempt has been made to compare individuals who are biochemically euthyroid with a history of hypothyroidism and normal individuals on four key dimensions: anxiety, depression, stress, and quality of life.

Standardized tools are regarded as the foundation for evidence-based assessment. Statistical validity and reliability have already been established, thus ensuring that responses are evaluated systematically so that resulting dimensions can be operationally defined.

The dimensions of stress, depression and anxiety have been measured by

Depression Anxiety Stress Scales- Short Form (DASS-21) (By Syd Lovibond and

Peter Lovibond, 1995) and quality of life has been measured by the WHOQOLBREF (World Health Organization Quality of Life Instrument-Short Form).

OBJECTIVES:

1. To find out if there is any significant difference between biochemically euthyroid individuals with a history of hypothyroidism and normal individuals with respect to anxiety.
2. To find out if there is any significant difference between biochemically euthyroid individuals with a history of hypothyroidism and normal individuals with respect to depression.
3. To find out if there is any significant difference between biochemically euthyroid individuals with a history of hypothyroidism and normal individuals with respect to stress.
4. To find out if there is any significant difference between biochemically euthyroid individuals with a history of hypothyroidism and normal individuals with respect to quality of life.

HYPOTHESES:

H1: There is a significant difference between biochemically euthyroid individuals with a history of hypothyroidism and normal individuals in respect to anxiety levels.

H2: There is a significant difference between biochemically euthyroid individuals with a history of hypothyroidism and normal individuals in respect to depression levels.

H3: There is a significant difference between biochemically euthyroid individuals with a history of hypothyroidism and normal individuals in respect to stress levels.

H4: There is a significant difference between biochemically euthyroid individuals with a history of hypothyroidism and normal individuals in respect to quality of life.

For the present study these dimensions have defined operationally.

OPERATIONAL DEFINITIONS:

Hypothyroidism: “Hypothyroidism is an underactive thyroid gland. Hypothyroidism means that the thyroid gland can’t make enough thyroid hormone to keep the body running normally. People are hypothyroid if they have too little thyroid hormone in the blood.” (American Thyroid Association)

Euthyroidism: “A condition where the thyroid gland as working normally and producing normal levels of thyroid hormone.” (American Thyroid Association)

Biochemically Euthyroid: “Patients were considered hypothyroid by 16 recognized criteria but whose free thyroxine (FT4) and thyroid stimulating hormone (TSH) fell within 95% laboratory reference intervals.” (Skinner et al., 2000, Journal of Nutritional & Environmental Medicine)

Anxiety: "An emotion characterized by apprehension and somatic symptoms of tension in which an individual anticipates impending danger, catastrophe, or misfortune. The body often mobilizes itself to meet the perceived threat: Muscles become tense, breathing is faster, and the heart beats more rapidly. Anxiety may be distinguished from fear both conceptually and physiologically, although the two terms are often used interchangeably. Anxiety is considered a future-oriented, long-acting response broadly focused on a diffuse threat, whereas fear is an appropriate, present-oriented, and short-lived response to a clearly identifiable and specific threat." (APA dictionary)

Depression- "A negative affective state, ranging from unhappiness and discontent to an extreme feeling of sadness, pessimism, and despondency, that interferes with daily life. Various physical, cognitive, and social changes also tend to co-occur, including altered eating or sleeping habits, lack of energy or motivation, difficulty concentrating or making decisions, and withdrawal from social activities. It is symptomatic of a number of mental health disorders." (APA dictionary)

Stress- "The physiological or psychological response to internal or external stressors. Stress involves changes affecting nearly every system of the body, influencing how people feel and behave. For example, it may be manifested by palpitations, sweating, dry mouth, shortness of breath, fidgeting, accelerated speech, augmentation of negative emotions (if already being experienced), and longer duration of stress fatigue. Severe stress is manifested by the general adaptation syndrome. By causing these mind-body

changes, stress contributes directly to psychological and physiological disorder and disease and affects mental and physical health, reducing quality of life." (APA dictionary)

Quality of life– “Individuals' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns.” (World Health Organization)

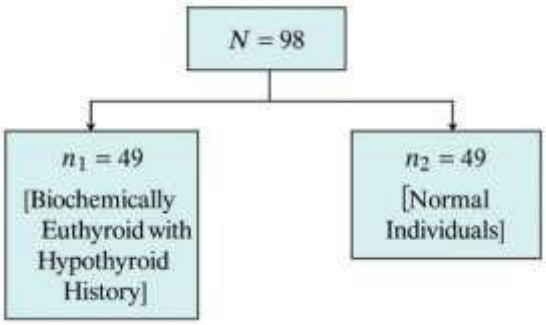
Mental health- "Mental health is a state of well-being in which an individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively, and is able to make a contribution to his or her community." (World Health Organization)

METHODS:

Sample-

The purposive sampling technique was used for the present study. A total number of 130 participants were approached, of which 98 participants provided informed consent and completed the questionnaire booklet. Out of these, usable data from 98 participants were selected based on the inclusion and exclusion criteria. Participants were selected from a private clinic (for individuals with a history of hypothyroidism) and from the general population (for normal individuals). The final sample consisted of 49 biochemically euthyroid individuals with a history of hypothyroidism and 49 euthyroid individuals with no thyroid-related medical conditions. All participants were selected from Kolkata.

Assignment of participants to Biochemically Euthyroid Individuals with Hypothyroid History and Normal Individuals category are as follows:



Several participants were excluded during screening due to comorbid chronic illnesses, such as diabetes and hypertension, or due to other disqualifying factors. Although more than 60 participants diagnosed with hypothyroidism were approached, only 49 fulfilled the eligibility criteria and were included in the final sample. Similarly, several individuals from the control group had to be excluded due to chronic physical or psychiatric conditions.

The participants were selected considering the following inclusion and exclusion criteria.

Inclusion and exclusion criteria:

GROUP 1: BIOCHEMICALLY EUTHYROID INDIVIDUAL WITH HISTORY OF HYPOTHYROIDISM

Inclusion Criteria:

- Adults aged 18-60 years.
- Earlier Diagnosed with hypothyroidism and under treatment
- Both males and females
- Willingness to participate and provide informed consent.

Exclusion Criteria:

- Individuals with any other mental or physical disorders.
- Pregnant or lactating women.
- From psychology field

GROUP 2: NORMAL INDIVIDUAL

Inclusion Criteria:

- Adults aged 18-60 years.
- Both males and females
- Willingness to participate and provide informed consent.

Exclusion Criteria:

- Individuals with any chronic mental or physical disorders.
- Pregnant or lactating women.
- From psychology field

DESCRIPTION OF THE TOOLS:

I. Demographic details & Duration of Hypothyroidism and Medication Use

An information schedule was used to gather demographic details name, age, education level, , residence (Rural/Urban), occupation, type of job (Government/Public Sector Undertaking/Private), health history, duration of thyroid dysfunction, current medication, dosage, medication Adherence and other medications.

II. Depression Anxiety Stress Scales- Short Form (DASS-21)

Description:

The Depression, Anxiety and Stress Scale (DASS-21) is a quantitative measure of distress developed by Syd Lovibond and Peter Lovibond at the University of New South Wales in 1995. It examines three areas; depression, anxiety, and stress. Each of the three subscales includes seven items.

In the area of depression, the scale measures levels of dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest/involvement, anhedonia, and inertia.

For anxiety, it measures autonomic arousal, situational anxiety, skeletal muscle effects and subjective experience of anxious affect.

Lastly, the stress related items evaluate difficulty relaxing, nervous arousal, being easily upset/agitated, being irritable/over-reactive, and impatience.

Administration:

This is a self-administering test. Participants are asked to rate each item on a 4point scale based on what they've experienced during the past week. The rating scale is as follows:

0 for Did not apply to me at all, 1 for Applied to me to some degree, or some of the time, 2 for Applied to me to a considerable degree, or a good part of time and 3 for Applied to me very much or most of the time

Scoring:

Sum scores are computed by adding up scores on the items per subscale and then it is needed to multiply the scale scores by 2. The severity of symptoms can then be interpreted according to the following cut-off points:

- 0–9: Normal
- 10–13: Mild
- 14–20: Moderate
- 21–27: Severe
- 28 and above: Extremely severe

Psychometric Properties:

The DASS-21 has shown excellent internal consistency, with Cronbach's alpha coefficients ranging from 0.81 to 0.97 for the subscales of depression, anxiety, and stress. It has good test-retest reliability, with stability correlations between 0.71 and 0.91. The tool has demonstrated solid construct validity, showing strong correlations with other measures of depression, anxiety, and stress. For measuring emotional distress and psychological functioning the DASS-21 is widely considered as a reliable and valid tool.

III. WHOQOL-BREF (World Health Organization Quality of Life – BREF)

Description:

The WHOQOL-BREF is a shorter version of the World Health Organization Quality of Life (WHOQOL) assessment tool. It is designed with 26 items to assess the quality of life across four domains: physical health, psychological health, social relationships, and environment. It is used to evaluate an individual's general wellbeing and life satisfaction in both clinical and general populations. The scale is applicable for 18-60 years of age groups and cultures, providing a multidimensional measure of quality of life.

Administration:

The WHOQOL-BREF is administered via self-report and can be completed in a paper or electronic format. It takes approximately 5–10 minutes to complete. The respondents are asked to reflect on their general quality of life during the past two weeks when answering the questions.

Scoring:

The WHOQOL-BREF uses a Likert scale for responses ranging from 1 (very poor) to 5 (very good). The total score for each domain is calculated by averaging the item scores within each domain. To assess overall quality of life the total scores are obtained. Higher scores indicate better quality of life. The results are interpreted according to predefined scoring instructions, which include domain-specific and overall quality of life scores.

Psychometric Properties:

The WHOQOL-BREF has demonstrated strong psychometric properties in multiple studies across diverse populations. It has shown high internal consistency with Cronbach's alpha values ranging from 0.70 to 0.90 for different domains. The scale has also demonstrated good test-retest reliability, with correlations ranging from 0.70 to 0.90. The instrument has proven validity in terms of construct validity, convergent validity, and discriminant validity. It has been shown to correlate well with other established quality of life and health-related measures. The WHOQOLBREF is considered a reliable and valid tool for assessing quality of life in both clinical and non-clinical populations.

PROCEDURE FOR DATA COLLECTION:

The study conducted a systematic screening to verify that participants fulfilled both the set inclusion requirements and exclusion criteria. Eligible participants in both settings were personally approached. Ideal informant consent procedures confirmed the purpose and objectives while receiving voluntary consent from each participant. The researchers guaranteed absolute confidentiality for participant data which could only be used for research purposes. The study participants received guidance to give their answers with complete truthfulness. Standardized psychological scales were distributed to participants after which the data collection procedure was conducted in a structured manner.

STATISTICAL ANALYSIS:

The analysis for this study employed Jamovi software. Data description included mean and median and mode with standard deviation calculation before applying the Shapiro–Wilk test to evaluate database distribution patterns. The Mann– Whitney U test became the appropriate statistical method because data for normality tests showed deviation from standard norms.

CHAPTER IV

RESULTS

RESULTS

Table 1: Results on normality of distribution

Variable	Group	Skewness	SE Skewness	ShapiroWilk W	ShapiroWilk p
Depression	B. Euthyroid	0.774	0.340	0.926	0.004
	Normal	1.980	0.340	0.774	<.001
Anxiety	B. Euthyroid	0.847	0.340	0.906	<.001
	Normal	2.130	0.340	0.734	<.001
Stress	B. Euthyroid	0.465	0.340	0.974	0.361
	Normal	0.779	0.340	0.909	0.001
Physical	B. Euthyroid	-0.369	0.340	0.954	0.052
	Normal	-1.320	0.340	0.884	<.001
Psychological	B. Euthyroid	0.119	0.340	0.958	0.079
	Normal	-0.134	0.340	0.926	0.004
Social	B. Euthyroid	-0.373	0.340	0.961	0.108
	Normal	-0.288	0.340	0.934	0.009
Environment	B. Euthyroid	0.320	0.340	0.949	0.033
	Normal	-0.480	0.340	0.907	<.001

Table 1 indicates that the Shapiro-Wilk p values for most variables are significant at the 0.01 level, suggesting that the data distribution for depression, anxiety, and several quality of life domains (particularly in the normal thyroid functioning group) deviates significantly from a normal distribution.

GRAPHICAL REPRESENTATION ON NORMALITY OF DISTRIBUTION

DEPRESSION

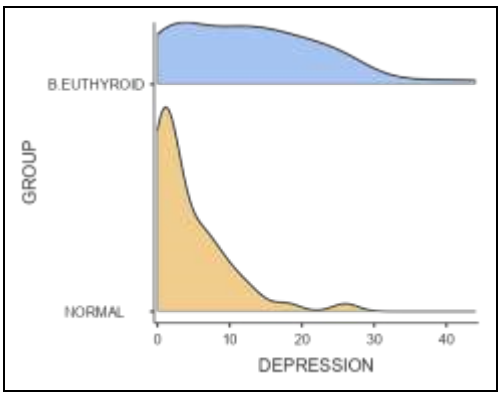


Fig: 1

ANXIETY

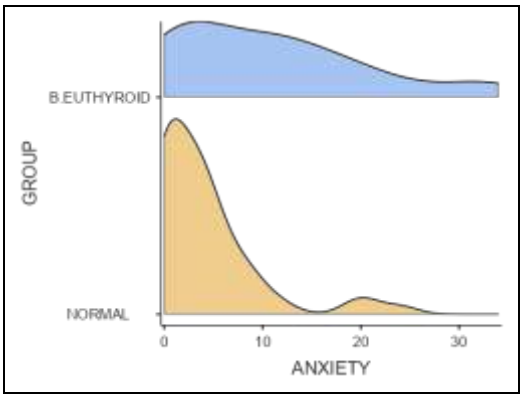


Fig: 2

STRESS

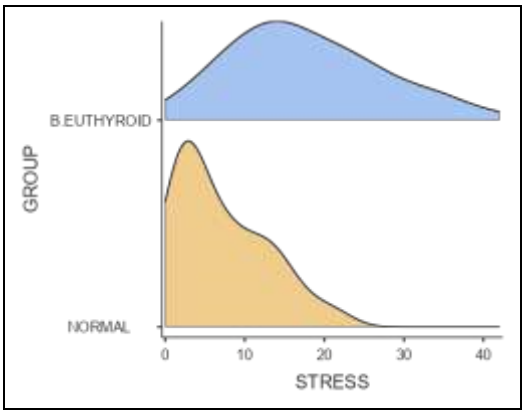


Fig: 3

PHYSICAL QOL

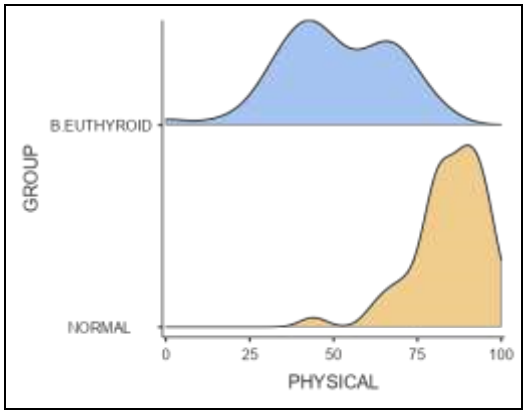


Fig: 4

PSYCHOLOGICAL QOL

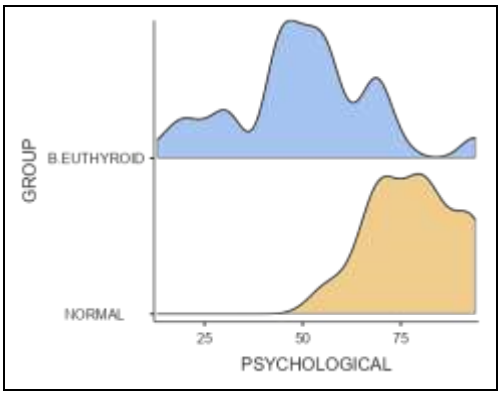


Fig: 5

SOCIAL QOL

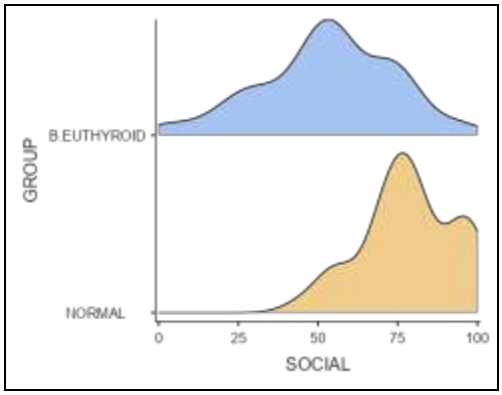


Fig: 6

ENVIRONMENT QOL

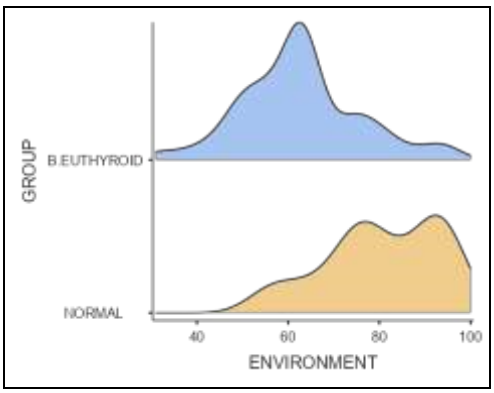


Fig : 7

Table 2: Descriptive statistics

Variable	Group	N	Mean	Median	Mode	SD
Depression	B. Euthyroid	49	12.8	10	2.00[a]	10.2
	Normal	49	4.31	2	0.00	5.34
Anxiety	B. Euthyroid	49	10.9	10	0.00	9.65
	Normal	49	4.14	2	0.00	5.41
Stress	B. Euthyroid	49	17.7	16	14.0	9.52
	Normal	49	7.02	6	2.00	5.78
Physical	B. Euthyroid	49	50.9	50	44.0	16.9
	Normal	49	84.5	88	81.0	10.9
Psychological	B. Euthyroid	49	50.2	50	44.0	17.7
	Normal	49	78.2	81	69.0[a]	11.0
Social	B. Euthyroid	49	52.8	56	56.0	20.9
	Normal	49	78.6	81	81.0	14.5
Environment	B. Euthyroid	49	62.6	63	63.0	13.1
	Normal	49	80.7	81	94.0	12.3

TABLE 2 represents descriptive statistics (mean, median, mode, and standard deviation) comparing depression, anxiety, stress, and quality of life domains (physical, psychological, social and environment) among biochemically euthyroid individual with a history of hypothyroidism and normal individuals.

Mean Scores: B. Euthyroid vs Normal

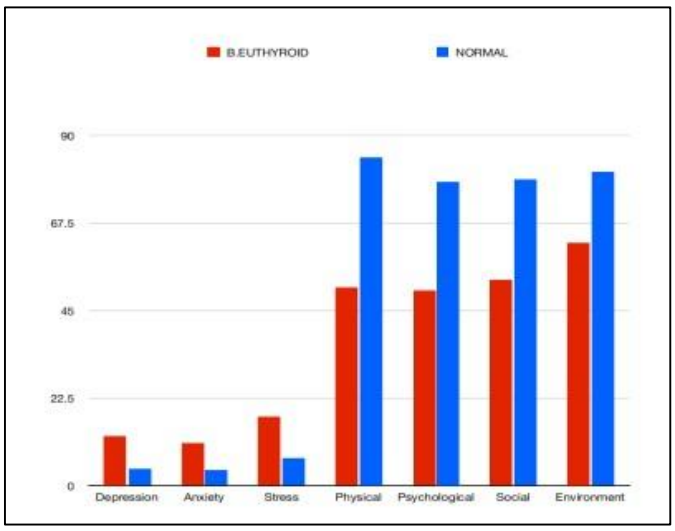


FIG:8

TABLE 3: INFERENTIAL STATISTICS

		Statistic	p
DEPRESSION	**Mann-Whitney U**	551	<.001
ANXIETY	**Mann-Whitney U**	668	<.001
STRESS	**Mann-Whitney U**	403	<.001
PHYSICAL	**Mann-Whitney U**	107	<.001
PSYCHOLOGICAL	**Mann-Whitney U**	208	<.001
SOCIAL	**Mann-Whitney U**	367	<.001
ENVIRONMENT	**Mann-Whitney U**	393	<.001

TABLE 3 represents the result of the Mann-Whitney U test conducted to examine group differences between biochemically euthyroid individuals with a history of hypothyroidism and normal individuals. The p-values for all variables were found to be statistically significant at the 0.05 level. Hence, the null hypotheses for each variable were rejected.

Chapter V

DISCUSSION

DISCUSSION:

Discussion on Normality of the distribution:

The research investigated hypothyroidism related mental health issues combined with diminished quality of life before evaluating how these problems improve after biochemical euthyroidism restoration. The findings of the Shapiro-Wilk test along with density plots, demonstrated that the measured variables: depression, anxiety, stress, and quality of life domains—did not follow a normal distribution for the majority of the data. The data in this investigation strayed considerably from the assumption of normality, prompting the choice to employ the MannWhitney U test as the optimal nonparametric statistical approach. The non-normal distribution of data points in this study can be attributed to the clinical characteristics of the sample. Particularly, Individuals who deal with hypothyroidism and have achieved biochemical euthyroidism, still continue to experience distinct emotional disturbances. Many a times these psychological symptoms get influenced by how individuals perceive their health status, along with the ongoing effects of fatigue and other residual symptoms. The deviations from normality is caused by the skewed self-report data from participants which might have been influenced by subjective factors. Regarding the concept of normality, previous research studies such as Martin et al. (2023) and Saravanan et al. (2002) have also highlighted the non-normal distribution of data while they have been studying individuals with a history of thyroid dysfunction. The data from Martin et al. (2023) demonstrated that individuals with biochemical euthyroidism missed the requirements for normality distribution after their hypothyroidism diagnosis. Research investigators accepted that participants who achieved normal thyroid hormone levels still experienced psychological distress leading to non-normal data distributions. Data distributions for hypothyroid patients studied by Saravanan et al. (2002) remained non normal despite reaching normal thyroid hormone levels. Non-parametric statistical methods came into use because their analysis showed physical and psychological symptoms endured between participants thus affecting data distribution patterns. The findings in this investigation align with the previously stated studies, supporting the conclusion that thyroid hormone regulation alone does not lead to a return to normal

psychological functioning or quality of life. The non-normal distributions found in these studies highlights the intricacy to study the psychological impacts of hypothyroidism, which suggest that factors which are beyond thyroid hormone levels such as psychological perceptions, symptoms that persist, and health experiences of individuals play significant role in shaping the emotional and psychological outcomes of individuals with a history of hypothyroidism.

Discussion on descriptive statistics:

WHOQOL-BREF questionnaire measured quality of life by assessing both physical health and emotional well-being as well as social relationships and environmental satisfaction in individuals. Each stage of quality of life received lower scores from participants with hypothyroidism history as shown by physical (M = 50.9), psychological (M = 50.2), social (M = 52.8), and environmental (M = 62.6) domains compared to euthyroid participants who scored higher across the same domains: physical (M = 84.5), psychological (M = 78.2), social (M = 78.6), and environmental (M = 80.7). Previous research demonstrated that people who survived hypothyroidism before achieving biochemical euthyroid status reported worse psychological health than participants without thyroid diseases. Such individuals showed elevated emotional distress when they had reached hormonal equilibrium from their previous hypothyroidism diagnosis. DASS 21 questionnaire assessed mental health and subjects with prior hypothyroidism had higher average depression scores at M = 12.8 while anxiety scores reached M = 10.9 and stress multiplied to M = 17.7. These results surpassed control group scores which were lower at depression M = 4.31, anxiety M = 4.14 and stress M = 7.02. Patients who achieved thyroid hormone normalization through treatment did not automatically recover psychologically according to test results. The repeated occurrence of similar performance levels across mean, median and modal scoring demonstrates that thyroid dysfunction history associates with ongoing emotional and functional problems among patients after their thyroid function stabilizes. The cognitive theory developed by Beck (1976) provides an explanation for how individuals with chronic illness develop negative thought patterns because of their ongoing treatment challenges and uncertain situations and diminished sense of selfcontrol. One major characteristic of negative thought patterns consists of distorted

beliefs that lead individuals to anticipate failures and criticize their own identity and predict future life without promise. Emotional distress remains active because of deeply entrenched cognitive habits despite any improvements in physical health status. The extracted outcomes support past research findings. Samuels et al. (2018) identified that levothyroxine successfully grooms hormone conditions yet many patients do not respond to it by having their depressive symptoms like fatigue or mood swings decrease. The study produced by Shivaprasad et al. (2018) demonstrated that Indian hypothyroid patients experienced deteriorated quality of life especially regarding their emotional state as well as physical health. Rakhshan et al. (2017) reported hypothyroidism patients have higher levels of anxiety and depression when measured against typical non-patient groups. Research findings from Martin et al. (2023) demonstrated that patients treated with thyroid hormones still exhibited reduced life satisfaction together with greater depressive symptoms compared to individuals without thyroid diseases. The study results demonstrate that psychological assistance should be included in hypothyroidism care. Hormone therapy treats the physical aspects of hypothyroidism but patients may need psychotherapy together with counselling to address their mental and emotional consequences for achieving better longterm results.

Discussion on comparison between Biochemically Euthyroid Individuals with a history of Hypothyroidism and Normal Individuals:

Two distinct participant groups underwent evaluation in the present study because they included people (1) with previous hypothyroidism diagnosis who reached biological euthyroidism after medical intervention and people (2) who never experienced thyroid disorders classified as normal individual. The research demonstrated substantial statistical contrasts ($p < 0.05$) between psychological test outcomes for various mental wellness areas starting from stress perception to depression state and life quality evaluation. Fundamental data indicated that the null hypotheses should be rejected because it allowed verification of the alternative hypothesis. Biochemical normalization of thyroid function does not eliminate the long-lasting psychological effects which seem to persist among patients with previous hypothyroidism. The developmental pattern of psychological issues from hypothyroidism arises from biological predispositions

together with personal emotional response methods and community-related social influences under the biopsychosocial model. Hypothyroidism debut causes important biological alterations that align with neurotransmitter disturbances particularly shown through serotonin and dopamine system dysfunction. The neurobiological unsteadiness takes time to heal because it lingers in thinking and emotional systems until medical thyroid hormone stabilization (Bauer et al., 2008). People with thyroid illnesses face poor illness comprehension and heightened body sensitivity as well as elevated health anxiety. The psychological stress from a combination of inadequate understanding and sensitiveness toward bodily symptoms weakens their self-efficacy and control which leads to an increased risk of depression and anxiety symptoms. Research findings from previous studies validate the connection between hypothyroidism and elevated psychological distress. A study by Zavareh et al. (2016) showed hypothyroid patients presented with much higher depressive symptoms than euthyroid patients through a statistical analysis. The statistical test results using Mann– Whitney U test produced a p-value of 0.010 to validate this difference. Medical treatment to establish biochemical euthyroidism does not eliminate the psychological problems which continue to disrupt patients even within optimal hormone parameters. The results demonstrate that hormonal control might not be enough to secure complete mental health recovery together with satisfactory quality of life achievement. The study's experimental findings confirm the research strategy and theoretical assumptions that assessment of both psychological and physiological factors remains vital for hypothyroidism patients.

Chapter VI

CONCLUDING REMARKS

CONCLUDING REMARKS

Conclusion of the study:

The present study was undertaken to explore the differences between biochemically euthyroid individuals with a history of hypothyroidism and normal individuals in respect to their mental health (depression, anxiety, and stress) and quality of life. The study was conducted on 98 participants (49 = biochemically euthyroid individuals with a hypothyroid history and 49 = normal individuals) drawn from various areas of Kolkata and its surroundings. The analysis of results as stated and discussed in the previous chapters of this report appears to be noteworthy, and the major trends of findings obtained therefrom seem to converge on certain points, on the basis of which the following conclusions may be drawn:

1. There exists a significant difference between biochemically euthyroid individuals with a hypothyroid history and normal individuals in respect to depression. Depression has been found to be higher among the biochemically euthyroid group than the normal group.

2. There exists a significant difference between biochemically euthyroid individuals with a hypothyroid history and normal individuals in respect to anxiety. Anxiety has been found to be higher among the biochemically euthyroid group than the normal group.

3. There exists a significant difference between biochemically euthyroid individuals with a hypothyroid history and normal individuals in respect to stress. Stress has been found to be higher among the biochemically euthyroid group than the normal group.

4. There exists a significant difference between biochemically euthyroid individuals with a hypothyroid history and normal individuals in respect to quality of life. Quality of life has been found to be lower among the biochemically euthyroid group than the normal group.

Limitations of the present study:

Research work does not end in common practice since every conclusion marks a starting point for fresh prospects. The main limitations of the study are related to the study design as well as methodology and data collection scope because these elements shaped both implementation and understanding of research findings. The following aspects may be regarded as the limitations of the study:

1. Time constraints required researchers to make adjustments toward reducing their sample population. With 98 participants consisting of both hypothyroid individuals (49) and regular individuals (49) the study presents possible limitations for generalizing research findings.
2. Participants in this study needed to fall within an age range of 18 through 60 years because the research excluded the psychological responses of older as well as younger demographics.
3. The researcher conducted interviews to collect data although self-reported responses might have been affected by participants' recall biases or socially desirable responses.
4. The research examined only people who maintained strict hypothyroidism medical adherence through regular drug use. The uniformity in the experimental group resulted from the study design but evaluation of mental health consequences for patients who were non-compliant would have provided additional information.
5. Administrators selected normal group participants who had no mental or physical conditions. The examination of a pure control group required specific participants but failed to show patterns that exist in widespread population diversity.
6. The researchers did not classify the amount of time patients spent with hypothyroidism diagnosis before reaching biochemical euthyroidism status so this could have resulted in divergent psychological results.
7. The study focused on a particular geographical region along with sociocultural aspects that could limit universal application of its results for different populations

Implication of the present study:

The research examining mental disorders caused by hypothyroidism with consequences for life quality in euthyroid subjects adds important knowledge about an understudied clinical group. The research investigated patients with hypothyroidism who reached biochemical euthyroid status yet still faced psychological disturbances alongside deteriorated life quality. People with existing hypothyroid issues experience elevated depression levels along with anxieties and stress while reporting inferior quality of life in comparison to individuals without thyroid condition history. The results indicate the necessity of extra mental health support because patients maintain psychological symptoms even when their thyroid hormone levels normalize. The biochemically treating these conditions through medications fails to resolve completely the psychological difficulties that these patients experience. The therapy method known as cognitive-behavioural therapy (CBT) shows great effectiveness in treating the emotional suffering and negative thinking patterns which come from thyroid dysfunction history. Treatment of thyroid dysfunction patients requires a biopsychosocial approach according to this study because it ensures proper attention to mental health and life quality alongside physical health care. People who have hypothyroidism historically show persistent fatigue as well as emotional disturbances that cannot be resolved by medication as their single treatment approach. This evidence shows that additional treatment methods beyond thyroid hormone management need to be employed because they will help patients with hypothyroid manage fatigue better alongside psychoeducation and support group participation. Routine medical care should incorporate psychological screenings as a standard practice for patients who have thyroid disorders. Treating psychological symptoms early on will lead to better health outcomes and improved quality of life among these medical patients. The public health outreach regarding mental health problems experienced by thyroid disorder patients beyond biochemical euthyroidism status needs to be intensified because this knowledge boosts healthcare quality together with population-level thyroid condition comprehension. The research reveals that therapeutic strategies must expand to deliver complete medical care which supports physical health and psychological health needs of thyroid patients. To enhance the long-term health outcomes of hypothyroidism

patients, medical practitioners must work together with policymakers as well as mental health specialists who must provide equal care for physical and mental health needs.

Suggestions for future research:

Time limitations together with other obstacles prevented an expansion of the research area. Modern society needs research to evaluate the effects of biochemical euthyroidism on mental health in patients with a history of hypothyroidism along with their quality of life. The subject requires more research investigation particularly among Indian demographic populations. Proper investigational opportunities exist in this field due to insufficient research conducted thus far and future research may need additional attention based on the following points:

1. A broader survey of people from different Indian territories would show deeper understanding of hypothyroidism patients with levothyroxine histories regarding their mental well-being and life quality status.

2. Researchers should merge qualitative and quantitative approaches when studying psychological and social effects of thyroid history to strengthen the understanding and quality of data.

3. There is a need to evaluate the lasting psychological effects of levothyroxine treatment as well as emotional symptoms that remain after successful biochemical treatment.

4. Studies investigating how age affects the mental health results of people with hypothyroidism history could determine if mental status links to age.

5. The research could analyse how treatment compliance affects psychological well-being among hypothyroid patients by evaluating depression, anxiety and stress symptoms as treatment adherence may impact these responses.

6. A study should examine the ways that environmental elements including urban-rural differences together with socio-economic standing and healthcare

service availability influence the mental state as well as life quality of people with hypothyroid history.

7. Research investigating how lifestyle components affecting mental health operate in hypothyroid patients should be examined in upcoming investigations.

8.Researchers should explore how biological, psychological, and social elements affect mental health results in hypothyroidism patients using the biopsychosocial approach.

9.Research that examines individuals with different thyroid conditions (including hyperthyroidism) using bigger participant numbers will show detailed relationships between thyroid abnormalities and mental health deterioration and life quality reduction.

Chapter VII

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Chapter VIII

APPENDICES

APPENDIX A

Client Information Sheet

STUDY TITLE**:** Exploring Mental Health and Quality of Life among Biochemically Euthyroid Individuals with a Hypothyroid History and Normal individuals: A Comparative Analysis in Kolkata.

SITE: Sister Nivedita University, Department of Psychology, DG block, (Newtown) Action Area 1, West Bengal: 700156.

Phone no: 7595044470/7595044471/759544472

You are invited to participate in this research study. The following information is provided for your perusal and understanding in order to help you to arrive at an informed decision whether you should participate in this research study. Please feel free to ask any questions relating to this study or the information provided below. Please sign the Informed Consent Form only if you are fully satisfied with the information given to you and understand the procedures involved in the study.

1. Research/Study purpose

The purpose of this study is to compare mental health and quality of life among individuals with hypothyroidism and those with normal individual. The study aims to identify potential psychological impacts of hypothyroidism and contribute to research in mental health and endocrinology.

2. Voluntary participation

Your participation in this study is voluntary; you may decline to participate at any time without penalty and without loss of benefits to which you are otherwise entitled.

3. Permission to conduct research:

The Ethics Committee and the regulatory authorities may look at your health records both in respect of the current study and any further research that may be conducted in relation to it, even if you withdraw from the study. However, your identity will not be revealed if any information is released to third parties or published.

4. Study procedures:

Participants will be required to fill out a set of standardized psychological questionnaires assessing anxiety, depression, stress, and quality of life. No medical interventions will be conducted, and participation involves only completing the questionnaire.

5. Duration of the study:

The study will be conducted over the period of Three months

6. Possible discomforts or risks

Not applicable

7. Possible benefits

While you may not receive direct benefits from participation, this study may contribute to a better understanding of the psychological effects of hypothyroidism, potentially leading to improved mental health interventions in the future.

8. What if new information became available

You will be notified of any new information that develops over the course of this study that may affect your willingness to participate in this study.

9. Cost of participation

You will not have to bear any extra cost for participation in the study.

10. Privacy & Confidentiality

All data obtained during the course of this study, will be kept confidential and will be accessible only to the investigating physicians. If the results of the study are published, you may be referred to by number or initials but not by name so as to protect your identity.

11. Compensation and alternative treatment in case of research related injury There is no physical intervention in this study; therefore, no physical injury is expected.

12. Your Autonomy

Finally, please note that you can withdraw from the study at any point of time without stating any reason(s) If you withdraw from the study prior to its completion, you will receive the usual standard of care for your disease, and your non participation will not have any adverse effects on your subsequent medical treatment or relationship with the treating physician. You may also be withdrawn from the study by the investigating physician if he or she feels that further continuation is not in the best interests of your health.

13. Conflict of Interest: None

For additional or emergency information you may contact:

Name of Guide: Anindita Mukherjee

Office Address: Sister Nivedita University, Department of Psychology, DG block, (Newtown) Action Area 1, West Bengal: 700156.

Email: anindita.m@snuniv.ac.in

Mobile No.: 9432161505

Student investigator Name: Neha Majumder

Office Address: Sister Nivedita University, Department of Psychology, DG block, (Newtown) Action Area 1, West Bengal: 700156.

Mobile No.: 6291726214

Email: majumderneha1999@gmail.com

For more information for your ethical rights, please contact:

Member Secretary

Madam Kuntal Mandal

Email: Kuntal.m@snuniv.ac.in

APPENDIX B

Informed Consent Form

Study Title: Exploring Mental Health and Quality of Life among Biochemically Euthyroid Individuals with a Hypothyroid History and Normal individuals: A Comparative Analysis in Kolkata.

Subject's Initials: _____

Subject's Name: _____

Date of birth/Age: _____

1. I confirm that I have read and understood the information sheet for the above study and have had the opportunity to ask questions. [ ]
2. I understand that my participation in the study is voluntary and that I am free to withdraw at any time, without giving any reason, without my medical care or legal rights being affected. [ ]
3. I have understood that Ethics Committee and the regulatory authorities will not need my permission to look at my health records both in respect of the current study and any further research that may be conducted in relation to it, even if I withdraw from the study. I agree to this access. However, I understand that my identity will not be revealed if any information is released to third parties or published. [ ]
4. I agree not to restrict the use of any data or results that arise from this study provided such a use is only for scientific purpose(s). [ ] 5. I agree to take part in the above study. [ ]

_____ Date: ____/____/____

Signature/Thumb impression of the Subject/

Legally Acceptable Representative (LAR)

_____

Signatory's Name

_____ Date: ____/____/____

Signature of Impartial Witness

_____

Name of Impartial Witness

_____ Date: ____/____/____

Signature of the Person obtaining consent

_____

Name of Person obtaining consent

APPENDIX C

Demographic Details

Name (initials only):

Age:

Gender:

Education level:

Marital status: Residence:

(Rural/Urban)

Occupation:

Type of job: (Government/Public Sector Undertaking /Private)

Health History:

Duration of Hypothyroidism and Medication Use

Duration of Thyroid Dysfunction:

Current Medication:

Dosage:

Medication Adherence:

Other Medications:

APPENDIX D

DASS21 *Name:* *Date:*

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you *over the past week*. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply to me at all
1 Applied to me to some degree, or some of the time
2 Applied to me to a considerable degree, or a good part of time
3 Applied to me very much, or most of the time

1	I found it hard to wind down	0	1	2	3
2	I was aware of dryness of my mouth	0	1	2	3
3	I couldn't seem to experience any positive feeling at all	0	1	2	3
4	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5	I found it difficult to work up the initiative to do things	0	1	2	3
6	I tended to over-react to situations	0	1	2	3
7	I experienced trembling (eg, in the hands)	0	1	2	3
8	I felt that I was using a lot of nervous energy	0	1	2	3
9	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10	I felt that I had nothing to look forward to	0	1	2	3
11	I found myself getting agitated	0	1	2	3
12	I found it difficult to relax	0	1	2	3
13	I felt down-hearted and blue	0	1	2	3
14	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15	I felt I was close to panic	0	1	2	3
16	I was unable to become enthusiastic about anything	0	1	2	3
17	I felt I wasn't worth much as a person	0	1	2	3
18	I felt that I was rather touchy	0	1	2	3
19	I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)	0	1	2	3
20	I felt scared without any good reason	0	1	2	3
21	I felt that life was meaningless	0	1	2	3

APPENDIX E

You would circle number 1 if you did not get any of the support that you needed from others in the last two weeks. Please read each question, assess your feelings, and circle the number on the scale for each question that gives the best answer for you.

THE WHOQOL-BREF

		Very poor	Poor	Neither poor nor good	Good	Very good
1 (G1)	How would you rate your quality of life?	1	2	3	4	5

		Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
2 (G4)	How satisfied are you with your health?	1	2	3	4	5

The following questions ask about **how much** you have experienced certain things in the last two weeks.

		Not at all	A little	A moderate amount	Very much	An extreme amount
3 (F1.4)	To what extent do you feel that (physical) pain prevents you from doing what you need to do?	1	2	3	4	5
4 (F11.3)	How much do you need any medical treatment to function in your daily life?	1	2	3	4	5
5 (F4.1)	How much do you enjoy life?	1	2	3	4	5
6 (F24.2)	To what extent do you feel your life to be meaningful?	1	2	3	4	5

		Not at all	A little	A moderate amount	Very much	Extremely
7 (F5.3)	How well are you able to concentrate?	1	2	3	4	5
8 (F16.1)	How safe do you feel in your daily life?	1	2	3	4	5
9 (F22.1)	How healthy is your physical environment?	1	2	3	4	5

The following questions ask about **how completely** you experience or were able to do certain things in the last two weeks.

		Not at all	A little	Moderately	Mostly	Completely
10 (F2.1)	Do you have enough energy for everyday life?	1	2	3	4	5
11 (F7.1)	Are you able to accept your bodily appearance?	1	2	3	4	5
12	Have you enough money to meet your	1	2	3	4	5

(F18.1)	needs?					
13 (F20.1)	How available to you is the information that you need in your day-to-day life?	1	2	3	4	5
14 (F21.1)	To what extent do you have the opportunity for leisure activities?	1	2	3	4	5

		Very poor	Poor	Neither poor nor good	Good	Very good
15 (F9.1)	How well are you able to get around?	1	2	3	4	5

The following questions ask you to say how **good or satisfied** you have felt about various aspects of your life over the last two weeks.

		Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
16 (F3.3)	How satisfied are you with your sleep?	1	2	3	4	5
17 (F10.3)	How satisfied are you with your ability to perform your daily living activities?	1	2	3	4	5
18 (F12.4)	How satisfied are you with your capacity for work?	1	2	3	4	5
19 (F6.3)	How satisfied are you with yourself?	1	2	3	4	5
20 (F13.3)	How satisfied are you with your personal relationships?	1	2	3	4	5
21 (F15.3)	How satisfied are you with your sex life?	1	2	3	4	5
22 (F14.4)	How satisfied are you with the support you get from your friends?	1	2	3	4	5
23 (F17.3)	How satisfied are you with the conditions of your living place?	1	2	3	4	5
24 (F19.3)	How satisfied are you with your access to health services?	1	2	3	4	5
25 (F23.3)	How satisfied are you with your transport?	1	2	3	4	5

The following question refers to **how often** you have felt or experienced certain things in the last two weeks.

		Never	Seldom	Quite often	Very often	Always
26 (F8.1)	How often do you have negative feelings such as blue mood, despair, anxiety, depression?	1	2	3	4	5